

134. A method of producing virus resistant plants comprising:

introducing into a plant cell a DNA coding for a gene, or fragment thereof, of the virus which when introduced into plant cells inhibits pathogenesis by the virus, wherein said DNA is in a sense direction and codes for a protein or polypeptide of said virus other than a coat protein;

recovering transformed plant cells; and
regenerating virus resistant plants from said transformed cells.

135. A recombinant DNA molecule comprising:
a promoter which is functional in plant cells and
a DNA sequence which encodes a protein or polypeptide native to a virus, other than a coat protein or polypeptide, operably linked to the promoter in a sense direction, wherein said recombinant DNA molecule when introduced into the plant cells will prevent the propagation of the virus.

136. A virus resistant plant comprising:
a recombinant DNA molecule having a gene, or fragment thereof, isolated from the virus, wherein said gene, or fragment thereof, is in a sense direction and encodes a protein or polypeptide of the virus other than a coat protein or polypeptide, wherein said recombinant DNA molecule when introduced into plant cells inhibits pathogenesis by the virus.

137. A method of making a host cell resistant to a virus for the host, comprising:
isolating DNA coding for a gene, or fragment thereof, which encodes a protein or polypeptide of the virus other than a coat protein or polypeptide;

operably linking said DNA, or fragment thereof, within an expression vector in a sense direction; and
transforming said host cells with said expression vector.

138. A method of making plant cells or plant tissue resistant to infection by one or more virus, comprising:

isolating DNA coding for a gene, or fragment thereof, which encodes a protein or polypeptide of the virus other than a coat protein or polypeptide;

operably linking said DNA within an expression vector in a sense direction; and

transforming said plant cells or plant tissue with said expression vector.

139. A method of producing virus resistant plants comprising:

introducing into a plant cell a DNA coding for a gene, or fragment thereof, of the virus which when introduced into plant cells inhibits pathogenesis by the virus, wherein said DNA either (i) is in an anti-sense direction for expression of anti-sense RNA or (ii) is both in a sense direction and encodes a coat protein or polypeptide;

recovering transformed plant cells; and

regenerating virus resistant plants from said transformed cells.

140. The method according to claim 139, wherein the DNA is in the sense direction and encodes a coat protein or polypeptide.

141. The method according to claim 139, wherein the DNA is in the anti-sense direction.

142. A recombinant DNA molecule comprising:
a promoter which is functional in plant cells; and
a DNA sequence, which encodes a protein or polypeptide
native to a virus, operably linked to the promoter, wherein the
DNA sequence either (i) is in an anti-sense direction for expression
of anti-sense RNA or (ii) is both in a sense direction and encodes a
coat protein or polypeptide, and wherein said recombinant DNA
molecule, when introduced into the plant cells, will prevent the
propagation of the virus.

143. The recombinant DNA molecule according to claim
142, wherein the DNA sequence is in the sense direction and
encodes a coat protein or polypeptide.

144. The recombinant DNA molecule according to claim
142, wherein the DNA sequence is in the anti-sense direction.

145. A virus resistant plant comprising:
a recombinant DNA molecule having a gene, or fragment
thereof, isolated from a virus, wherein said gene, or fragment
thereof, when introduced into plant cells either (i) is in an anti-
sense direction for expression of anti-sense RNA or (ii) is both in a
sense direction and encodes a coat protein or polypeptide of the
virus, and wherein said gene, or fragment thereof, when introduced
into plant cells inhibits pathogenesis by the virus.

146. The virus resistant plant according to claim 145,
wherein said gene or fragment thereof is in the sense direction and
encodes a coat protein or polypeptide.

147. The virus resistant plant according to claim 145, wherein said gene or fragment thereof is in the anti-sense direction.

148. A method of making a host cell resistant to a virus for the host, comprising:

isolating DNA coding for a gene, or fragment thereof, of said virus;

operably linking said DNA, or fragment thereof, within an expression vector, wherein said DNA either (i) is in an anti-sense direction or (ii) is both in a sense direction and encodes a coat protein or polypeptide of said virus; and

transforming said host cells with said expression vector.

149. The method according to claim 148, wherein said DNA or fragment thereof is in the sense direction and encodes a coat protein or polypeptide.

150. The method according to claim 148, wherein said DNA or fragment thereof is in the anti-sense direction.

151. A method of making plant cells or plant tissue resistant to infection by one or more virus, comprising:

isolating DNA coding for a gene, or fragment thereof, of said virus;

operably linking said DNA, or fragment thereof, within an expression vector, wherein said DNA either (i) is in an anti-sense direction or (ii) is both in a sense direction and encodes a coat protein or polypeptide of said virus; and

transforming said plant cells or plant tissue with said expression vector.

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152. The method according to claim 151, wherein said DNA or fragment thereof is in the sense direction and encodes a coat protein or polypeptide.

153. The method according to claim 151, wherein said DNA or fragment thereof is in the anti-sense direction.

Please amend claims 29, 31, 37, 61-64, 66, 69, 70, 72, 77, 78, 80, 82, 105-112, 114, 117, 118, 120, 121, 125, 126, 131, and 132 as follows:

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29. (Amended) A transformed virus-resistant plant cell comprising chromosomal DNA comprised of:

(a) a promoter which functions in plant cells to cause the production of RNA sequences of a plant virus;

(b) a DNA sequence that causes the production of an RNA sequence, said RNA sequence encoding the coat protein of said plant virus; and

(c) a 3' flanking sequence.

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31. (Amended) A plant cell according to claim 29, wherein said DNA sequence is expressed by said plant cell such that said coat protein is present in said plant cell.

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37. (Amended) A recombinant, double-stranded DNA molecule comprising in sequence:

(a) a promoter which functions in plant cells to cause the production of RNA sequences of a plant virus;

(b) a DNA sequence that causes the production of an RNA sequence, said RNA sequence encoding the coat protein of said plant virus; and

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(c) a 3' flanking sequence, wherein the recombinant double-stranded DNA molecule, when introduced into a plant cell, inhibits pathogenic activity of said plant virus.

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61. (Amended) The method according to claim 134, wherein said plant is a tomato plant.

62. (Amended) The method according to claim 134, wherein said plant is cotton.

63. (Amended) The method according to claim 134, wherein said plant is potato and said virus is potato virus X.

64. (Amended) The method according to claim 134, wherein said plant is potato and said virus is potato virus Y.

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66. (Amended) The method according to claim 134, wherein the DNA coding for the gene, or fragment thereof, of the virus is operably linked with a promoter which causes expression of a product sufficient to inhibit pathogenesis by the virus.

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69. (Amended) The method according to claim 134, wherein the DNA sequence encodes a viral replicase gene or a fragment thereof.

70. (Amended) The method according to claim 134, wherein the DNA encodes a viral replicase binding site.

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72. (Amended) The method according to claim 134, wherein said virus is selected from the group consisting of alfalfa mosaic virus, brome mosaic virus, barley yellow dwarf virus, beet yellows virus, cucumber mosaic virus, lettuce necrotic yellow

98 virus, maize chlorotic dwarf virus, pea enation virus, potato virus S, potato virus X, potato virus Y, southern bean mosaic virus, tomato ringspot virus, tobacco ringspot virus, tobacco mosaic virus, tobacco streak virus, turnip yellow mosaic virus, and wound tumor virus.

99 77. (Amended) The recombinant DNA molecule according to claim 135, wherein the DNA sequence encodes a viral replicase gene or a fragment thereof.

78. (Amended) The recombinant DNA molecule according to claim 135, wherein the DNA sequence encodes a viral replicase binding site.

100 80. (Amended) The recombinant DNA molecule according to claim 135, wherein said virus is selected from the group consisting of alfalfa mosaic virus, brome mosaic virus, barley yellow dwarf virus, beet yellows virus, cucumber mosaic virus, lettuce necrotic yellow virus, maize chlorotic dwarf virus, pea enation virus, potato virus S, potato virus X, potato virus Y, southern bean mosaic virus, tomato ringspot virus, tobacco ringspot virus, tobacco mosaic virus, tobacco streak virus, turnip yellow mosaic virus, and wound tumor virus.

101 82. (Amended) A vector containing the recombinant DNA molecule according to claim 135.

102 105. (Amended) The virus resistant plant according to claim 136, wherein the gene, or fragment thereof is maintained within the plant genome.

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106. (Amended) The virus resistant plant according to claim 136, wherein the gene, or fragment thereof is maintained on a vector capable of replicating in the host.

107. (Amended) The virus resistant plant according to claim 136, wherein the plant is dicotyledonous

108. (Amended) The virus resistant plant according to claim 136, wherein the plant is monocotyledonous

109. (Amended) The virus resistant plant according to claim 136, wherein said plant is a tomato plant.

110. (Amended) The virus resistant plant according to claim 136, wherein said plant is cotton.

111. (Amended) The virus resistant plant according to claim 136, wherein said plant is potato and said virus is potato virus X.

112. (Amended) The virus resistant plant according to claim 136, wherein said plant is potato and said virus is potato virus Y.

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114. (Amended) The virus resistant plant according to claim 136, wherein the DNA coding for the gene, or fragment thereof, of the virus is operably linked with a promoter which causes expression of said protein or polypeptide sufficient to inhibit pathogenesis by the virus.

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117. (Amended) The virus resistant plant according to claim 136, wherein the DNA sequence encodes a viral replicase gene or a fragment thereof.

118. (Amended) The virus resistant plant according to claim 136, wherein the DNA encodes a viral replicase binding site.

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120. (Amended) The virus resistant plant according to claim 136, wherein said virus is selected from the group consisting of alfalfa mosaic virus, brome mosaic virus, barley yellow dwarf virus, beet yellows virus, cucumber mosaic virus, lettuce necrotic yellow virus, maize chlorotic dwarf virus, pea enation virus, potato virus S, potato virus X, potato virus Y, southern bean mosaic virus, tomato ringspot virus, tobacco ringspot virus, tobacco mosaic virus, tobacco streak virus, turnip yellow mosaic virus, and wound tumor virus.

121. (Amended) The virus resistant plant according to claim 120, wherein said virus is selected from the group consisting of tobacco mosaic virus, cucumber mosaic virus, alfalfa mosaic virus, and tobacco ringspot virus.

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125. (Amended) The method according to claim 137, wherein said gene or fragment thereof is a viral replicase gene or a fragment thereof.

126. (Amended) The method according to claim 137, wherein said gene or fragment thereof contains a binding site for a replicase enzyme.